

(54) Title of the invention : GREEN SYNTHESIS OF CERIUM OXIDE NANOPARTICLES USING MORUS RUBRA EXTRACT

(51) International classification	:B82B 3/00, C01F 17/235, A61K 9/51, A61K 33/244, A61K 9/14	(71)Name of Applicant : 1)JSS COLLEGE OF PHARMACY – JSS Academy of Higher Education & Research Address of Applicant :Post Box No. 20, Rocklands, Ootacamund, The Nilgiris - 643001, Tamil Nadu, India. OOTY Tamil Nadu India
(31) Priority Document No	:NA	(72)Name of Inventor : 1)Dhandapani Nagasamy Venkatesh
(32) Priority Date	:NA	2)Raagul Seenivasan
(33) Name of priority country	:NA	3)Ellaiyarasu Chandran
(86) International Application No	:	4)Gokulavasan Sakkarapani
Filing Date	:01/01/1900	5)Selvarasan Vijayan
(87) International Publication No	: NA	6)Sundaravadhanan Navukkarasu
(61) Patent of Addition to Application Number	:NA	7)Susanth Gowdru Shanthakumar
Filing Date	:NA	8)Syed Suhaib Ahmed
(62) Divisional to Application Number	:NA	9)Dr. Pitta Sriramcharan
Filing Date	:NA	10)Alin Bose Johnson
		11)Raman Rajeshkumar

(57) Abstract :

The present invention relates to a green synthesis process for preparation of cerium oxide nanoparticles (CeO₂ nanoparticles/nanoceria) utilizing Morus rubra plant extract as a natural reducing, stabilizing, and capping agent for development of biocompatible nanoparticle systems exhibiting enhanced antioxidant and anticancer activity. The synthesized cerium oxide nanoparticles possess controlled nanoscale particle size, improved colloidal stability, substantially spherical morphology, and mixed Ce³⁺/Ce⁴⁺ oxidation states enabling enhanced reactive oxygen species scavenging and redox-regulating activity. The nanoparticles are characterized using UV-visible spectroscopy, FTIR, DSC, XRD, SEM, particle size analysis, and zeta potential analysis confirming successful nanoparticle formation and stability. The synthesized nanoparticles demonstrate significant antioxidant activity through DPPH, ABTS, nitric oxide scavenging, and ferric ion chelation mechanisms together with selective dose-dependent cytotoxic activity against MCF-7 breast cancer cells. The invention further provides environmentally sustainable, scalable, and pharmaceutically applicable nanotechnology suitable for oncology, nanomedicine, targeted drug delivery, and oxidative stress-associated therapeutic applications.

No. of Pages : 27 No. of Claims : 9